

Chapter One

Introduction to Transportation Demand Management

Transportation demand management (TDM) is a term applied to a broad range of strategies that are primarily intended to reduce and reshape demand (use) of our transportation system. TDM focuses on reducing or changing travel demand rather than increasing transportation supply, thereby increasing the efficiency of the transportation system. Most TDM strategies are intended to modify travel behavior, using measures which either eliminate trip making, change the time of day trips are made, or accommodate person trips in fewer vehicles. TDM measures may include incentives, disincentives, provision or enhancement of non-SOV alternatives, and employer-based programs. Such strategies are often relatively low cost, especially when compared to “build” alternatives. They are also inherently more flexible and adaptable. Their success depends both upon the active cooperation of the private sector, and upon providing real alternatives to auto travel in order to affect the decisions of individuals who use the transportation system.

Some TDM measures have been in use for years, such as carpooling, which began in earnest during World War II. Broader implementation of TDM began during the late 1970’s and the early 1980’s, stimulated by the energy crises set off by our heavy reliance on foreign energy resources. TDM has recently “come of age,” driven by ever-increasing congestion, shrinking transportation funding and federal mandates — including that air quality be improved in our urban areas and that we give broader consideration to how federal transportation dollars are spent.

Why TDM in Planning?

Transportation demand management (TDM) strategies have become a new focus for transportation professionals — planners, engineers, capital project managers, and policy makers — who are seeking and evaluating alternatives to large capital investments. Demand management measures offer the lure of lower cost solutions to our congestion problems and capacity needs. They also offer the potential to forestall construction of new and expanded facilities by reducing road use and extending the life cycle of existing infrastructure. Both the Federal Transit Agency (FTA) and the Federal Highway Administration (FHWA) strongly suggest that TDM measures be included in Environmental Impact Statements (EISs) required by the National Environmental Policy Act (NEPA). TDM measures have also been incorporated into the Washington State Transportation Policy Plan, the Growth Management Act (GMA), the State Environmental Policy Act (SEPA), and the Washington Commute Trip Reduction (CTR) Law.

TDM continues to evolve as a discipline, currently in a rather awkward stage of adolescence. TDM is becoming more widely understood by transportation professionals, politicians, employers, even the general public. Some programs, such as vanpooling and worksite-based programs, have well-documented rates of effectiveness. However, at times TDM can remain a hard-sell.

There are several reasons for this. Effectiveness of individual TDM strategies is difficult to document - partially because TDM strategies usually occur in combination with each other. And even though the flexibility of TDM programs makes them much more adoptable to changing conditions, it makes evaluation and generalization even more difficult. For this reason, TDM is rarely incorporated into models beyond various forms of pricing (road pricing or parking pricing, for instance). Of course, discussions of pricing rarely go anywhere due to political difficulty.

Still, TDM's role is expanding all the time as the drawbacks of relying totally on build solutions becomes clearer, our life-styles grow more complex, and our urban areas become more congested. Nonwork trips, which make up the bulk of trips (75-80%), are an obvious target for TDM. So is freight movement and mitigation during construction projects. New technology has many TDM applications, and as the linkages of transportation behavior and land use become more well documented, land use is increasingly being used as a long-run TDM strategy.

TDM in Policy

Times are changing, albeit slowly. Due to concerns about the impacts of highway expansion on air and water quality, endangered species, quality of life, and congestion, it is no longer assumed to be the best solution in all situations. Several federal and state policies encourage the implementation of TDM strategies to avoid, postpone, or supplement build solutions. This promotes an evenhanded comparison of alternative solutions — allowing us to move away from an exclusively supply-side outlook to one that is better balanced with demand-side measures. As congestion worsens in many parts of the state, more attention is given to TDM.

In addition to the legislation discussed below, there is an increased emphasis on voluntary TDM programs, such as those developed by Transportation Management Associations (TMAs). In today's tight labor market, businesses are using TDM strategies to attract and maintain employees.

Federal Guidance

Recent policy changes at the federal level encourage a specific focus on demand management and system management strategies. The Clean Air Act of 1990 (CAA) requires metropolitan areas affected by air pollution to change their policies to discourage unnecessary car use and promote transit, walking and bicycling. Regions that are not in compliance with CAA standards for one or more pollutants can lose federal transportation funding unless they show they are taking action that will bring them into compliance in the future. The Atlanta region serves as a prime example. Due to poor air quality, federal transportation dollars were withheld until recently, when the region revised their transportation plan. The Puget Sound region is on the verge of noncompliance, with several mild summers preventing key air pollutants from exceeding air quality thresholds.

With the addition of several species of salmon to the Endangered Species list, the rules of the development game are changing in much of the northwest. Although it is still unclear what the impacts of the revised listing will be, it may require major changes in the way we look at roadway projects, with a new prominence for TDM.

The Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) and its 1998 successor, the Transportation Equity Act for the 21st Century (TEA-21) made substantial changes to the criteria and process for allocating federal funds to capital investment projects. New sources of funding provide money to projects that improve air quality and increase transportation options. Flexible funding allows states to designate highway monies for highways or transit. TEA-21 also encourages roadway preservation over capacity expansion.

As a result of the National Environmental Policy Act (NEPA), passed in 1969, all major transit and highway capacity expansions that include federal funds complete the Environmental Impact Statement (EIS) process. The EIS is expected to identify all “reasonable alternative strategies” for addressing the transportation demands and problems in a corridor or subarea. NEPA guidelines strongly recommend that a stand-alone TDM/TSM¹ alternative be considered in the development of the alternatives for the EIS. Although typically a TDM/TSM alternative will not be sufficient to meet purpose and need, TDM and TSM components will frequently be packaged as elements of different alternatives. No matter what, NEPA requirements make it necessary for transportation planners to have a good working knowledge of the full range of TDM strategies, an understanding of how TDM strategies can work together and in combination with other alternatives, and an idea of how effective TDM can be in various situations.

Washington State Policy

The State of Washington has joined the federal government in facilitating the inclusion of TDM alternatives and strategies in the planning process. The State Environmental Policy Act (SEPA) parallels NEPA by requiring EISs to be completed on all actions of statewide environmental significance. The Washington Transportation Plan (WTP), currently being updated, already gives TDM a prominent role, assuming that a substantial percentage of growth in trips over the next 20 years will be accommodated by TDM.

¹A footnote on TSM: Transportation System Management (TSM) is closely related to TDM. Although TDM and TSM can sometimes overlap, TSM differs from TDM by the fact that it deals with the operation and management of (rather than the demand for) transportation infrastructure. TSM strategies enhance the efficiency of the existing infrastructure, and are primarily physical and operational mechanisms. Examples of TSM strategies include: freeway ramp metering, electronic driver information systems, incident detection/management programs, HOV lanes, signal optimization and coordination, channelization improvements and reversible lanes.

At the policy-making level, WSDOT has recently changed the former HOV Policy Board to the HOV/TDM Policy Board. This board will advocate for the inclusion of TDM at the statewide policy level and oversee development of a formal, comprehensive TDM program for WSDOT.

The Commute Trip Reduction (CTR) Law, passed in 1990, requires companies with over 100 employees in Washington's nine largest counties to implement and monitor commute trip reduction programs. Businesses are becoming more aware that, in congested areas, TDM can help to attract and retain employees. According to the WSDOT's Commute Trip Reduction Office, as of December 1999, 1,103 worksites participate in the program, 92 of them voluntarily. Around 70% of affected worksites go beyond the bare-bones "good faith effort" required by the law. As the CTR office states in their 1999 Report to the Washington State Legislature, "Innovation and investment of resources are the norm rather than the exception." As well as having direct impacts on congestion and air quality, the CTR Law has had the indirect effect of educating and building support for TDM in the private sector.

Washington's Growth Management Act also provides several means of support for TDM, both directly and indirectly. Local jurisdictions required to develop comprehensive plans under the GMA must include a transportation element that addresses demand management strategies. In development of Regional Transportation Plans, Regional Transportation Planning Organizations (RTPOs) are required to use a least-cost planning methodology, which allows TDM to compare more favorably to traditional build alternatives. Further, the GMA supports all land use-based TDM strategies by encouraging compact, efficient and more balanced land use.

Classification of TDM Strategies

For the sake of clarity, the TDM strategies looked at in depth within this document were grouped into six major categories. These categories are neither mutually exclusive or exhaustive, nor are they the only way of grouping the different strategies. However, we felt that making some general distinctions among the different types of TDM strategies could be useful in identifying which TDM measures to use in the different planning processes and in different situations.

Alternative Mode Support Strategies include publicly-provided alternatives to single occupant vehicle (SOV) travel and those services and facilities that encourage and support other modes. Alternative mode support strategies include:

- Public Education and Promotion
- Ridematching Services
- Transit Services
- Vanpool Services
- Custom Transit Services
- Non-Motorized Mode Support
- HOV Facilities
- Park & Ride Lots
- Carsharing

Worksite-Based Strategies are private sector programs and services that encourage employees to change commuting patterns on a worksite by worksite basis. They may be provided by developers or employers. These strategies include incentives that make publicly-provided modes more attractive, disincentives to solo commuting and employer management policies that provide employees with flexibility in mode choices. The worksite-based strategies include:

- Monetary Incentives
- Alternative Work Schedules
- Guaranteed Ride Home
- Parking Management
- Facility Amenities
- Transportation Management Associations (TMAs)

Land Use Strategies are potentially some of the most effective TDM strategies in the long run. They change densities, land use, urban design and land use mix to impact travel needs and patterns. Land use strategies include:

- Compact Residential Development
- Compact Employment and Activity Centers
- Mixed Land Uses

- Connectivity
- Transit and Pedestrian Oriented Design
- Parking Management
- Jobs/Housing Balance
- Affordable Housing
- Development Impact Mitigation

Programmatic and Policy Support Strategies introduce restrictions and regulations to auto use and provide political/program support and guidance to new institutional relationships:

- Trip Reduction Ordinances and Programs
- Access Priority/Restriction
- Support of New Institutional Relationships

Telecommunications Strategies are emerging demand management solutions that are based in advanced telecommunications technologies:

- Information Services
- Internet-Based Strategies (Teleshopping)
- Telecommuting (telework)

Pricing Strategies are tax and pricing schemes that affect the cost of transportation and thereby provide monetary disincentives to some travel behavior and incentives to others:

- Parking Pricing
- Gasoline Tax Increases
- Road/Congestion Pricing
- VMT Tax
- Transit and Vanpool Fare Subsidies

Characteristics of TDM Strategies

As evidenced in the preceding description, TDM strategies include a great variety of programs, services, policies, and regulations. They cannot be applied equally and effectively in all markets. They take various lengths of time for development and implementation and they may be authorized or implemented by many different public and private sector groups.

Table 1.1 presents a summary matrix of several characteristics of demand management strategies. Additional detail and discussion about each individual strategy is included in Appendix I. Table 1.1 is designed to provide the reader with summary information — at a single glance — for a preliminary comparison among the strategies. It should be helpful in identifying, quickly, the categories or individual measures that are likely candidates for inclusion in a study alternative. The characteristics presented in Table 1.1 are these:

Application or Market Area is the target market to which the strategy can be applied. Markets are identified by geographic indicators, densities, types of development, type of facility, type of travel (commute), and/or time of day (peak vs. off-peak). It should be noted that in urbanized parts of the state, publicly provided TDM strategies and employer strategies are increasingly being implemented because of the CTR Law. It will be important for the planner to acknowledge other TDM-supportive services currently in place before projecting trip reductions to be achieved through TDM measures. It is also important to consider new applications for strategies that have, to date, been restricted to specific markets. It may be effective, for example, to develop programs that combine express transit services in an HOV lane with a peak hour, free fare zone along an entire highway corridor — thereby addressing the target markets and target needs for trip reduction.

Time Frame To Implement identifies the approximate term within which a demand management strategy could be implemented. Strategies are identified as requiring a *short* time period (less than two years), a *medium* time period (two to five years), or a *long* time period (more than five years). Timing is an interesting dimension of TDM assessment. Implementation time does not necessarily correspond to the time needed to bring about behavior changes. Land use designations, for example, can be implemented fairly quickly by a local jurisdiction, yet the changes in use and designation may be decades away from full realization.

Enabling Authority identifies the party (or parties) responsible for introducing, enabling, or mandating each measure.

Implementing Authority indicates the party (or parties) responsible for putting the strategy in place, and administering, operating and enforcing the TDM measure.

The enabling and implementing authorities are important considerations for the TDM planner. The selection of appropriate strategies will depend to a great degree on what commitments can be gained from the various stakeholders. Some TDM strategies, such as regulation of land use by local jurisdictions, are totally within the authority of specific entities. Others could be established and implemented under several different authorities — such as the initiation of vanpooling by individuals, employers, transit agencies, counties, cities, and state agencies. Authority and control of various aspects of TDM planning and implementation may, therefore, lie with several different stakeholders. Clearly, there may be delicate “turf” issues that will need to be handled carefully so that proposed strategies and combinations can be implemented - potentially with innovative new institutional arrangements.

In Appendix 1 the TDM strategies contained in the Table 1.1 are described in more detail. Table 1.1 is designed to assist in the development of a preliminary list of potential strategies for a TDM program or alternative, in conjunction with Appendix 1 and the Preliminary Screening Criteria in Chapter 3.

Table 1.1**Characteristics of TDM Strategies**

			Enabling Authority				Implementing Authority					
Strategy	Application Market Area	Time Frame To Implement	State	Region	City/County	Transit Agency	State	Region	City/County	Transit Agency	Private Sector	NonProfit
Alternative Mode Support Strategies												
Public Education and Promotion	all	short - long	X	X	X	X	X	X	X	X	X	X
Ridematching Services	urban & suburban commute trips not well-served by transit	short - medium		X	X	X		X	X	X	X	
Transit Services	urban & suburban	short - long		X	X	X		X	X	X	X	
Vanpool Services	longer urban & suburban commute trips	short - medium	X	X	X	X	X	X	X	X	X	
Custom Transit Services	suburban	medium		X	X	X		X	X	X	X	
Non-Motorized Mode Support	short commuting & non-commute	short-long	X	X	X		X	X	X		X	X
HOV Facilities	congested corridors	medium-long	X		X		X		X	X		
Park & Ride Lots	congested corridors	short-medium	X		X	X	X		X	X	X	
Carsharing	urban and some suburban areas	medium								X	X	X
Worksite-Based Strategies												
Monetary Incentives	commuters	short								X	X	
Alternative Work Schedules	commuters	short									X	
Guaranteed Ride Home	commuters	short								X	X	
Parking Management	commuters	short - medium			X						X	
Facility Amenities	large employers and sites in areas with little mixed-use development	short-medium			X						X	
Transportation Management Associations	multi-employer sites and areas	short-medium							X		X	

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Land Use Strategies												
Compact Residential Development	urban & suburban	short-long			X				X		X	X
Compact Employment and Activity Centers	urban & suburban	short-long			X				X		X	X
Mixed Land Uses	urban & suburban	medium-long			X				X		X	X
Connectivity	existing or developing suburban areas	medium	X		X		X		X		X	X
Transit/Pedestrian Friendly Urban Design	urban & suburban	short-long	X		X				X	X	X	X
Parking Management	urban & suburban	short-long			X				X		X	X
Jobs/Housing Balance	regional, urban & suburban	short-long		X	X			X	X		X	
Providing Affordable Housing	all areas	short-long	X	X	X			X	X		X	X
Development Impact Mitigation	developing areas	medium	X		X				X		X	
Public Policy & Regulatory Strategies												
Trip Reduction Ordinances	congested or rapidly growing areas	medium	X		X				X	X	X	
Access Priority/Restriction	highly congested facilities or centers	long	X		X				X			
Support of New Institutional Relationships	all areas	short-medium	X		X			X	X	X	X	X

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	Application Market Area	Time Frame To Implement	State	Region	City/County	Transit Agency	State	Region	City/County	Transit Agency	Private Sector	NonProfit
Telecommunications Strategies												
Information Services	Any geographic location	short-medium					X	X	X	X	X	X
Internet-Based Strategies (teleshopping)	Any location or market	short - medium					X	X	X	X	X	X
Telecommuting (telework)	Any location or market	short - medium					X	X	X	X	X	X
Pricing Strategies												
Parking Pricing	dense urban areas; jurisdictional or areawide application	medium-long	X		X		X	X	X		X	
Gas Tax Increase	statewide or local: all vehicle trips	short-long	X	X	X		X	X	X			
Road/Congestion Pricing	congested routes, road segments or regions	long	X		X		X		X			
VMT Tax	statewide or local/regional; all vehicle trips	medium-long	X		X		X	X	X			
Transit and Vanpool Fare Subsidies	within operations area; low income, elderly, students	short-medium				X	X		X	X	X	

Chapter Two

Including TDM in the Planning Process

TDM has many applications within the planning process. Although this guide spends a great deal of time discussing how TDM fits into the EIS process, this is primarily due to the complexity and procedural formality necessary in the development of an EIS. There are many other places in the planning process to include TDM strategies, including:

- Within the development of a comprehensive plan or a transportation plan
- For mitigation of construction, development, or other traffic impacts
- As a strategy to postpone capital investments
- On a programmatic basis - at worksites, for residential neighborhoods or for events

Although some of these processes have procedural requirements as well, they are less stringent than those necessary for an EIS. For this reason, this chapter contains descriptions of two processes: the general planning process and the EIS process.

The general planning process description will be useful in program and plan development and will also apply to planners working within the context of an EIS. For that reason, planners working within the EIS process should read both sections carefully. The other is more specific, intended for use in the development of TDM strategies/alternatives for an EIS.

General TDM Planning Process

Step 1: Advanced Preparation

Before commencing the development of a program/plan, the lead team members will need to outline its basic parameters. In some cases, the following parameters may be obvious or already set. In others, they will warrant additional discussion:

- Goals and objectives
- Geographic boundaries
- Mobility needs and problems
- Stakeholders
- Timeline/work plan
- Framework for solutions (is it necessary to outline specific program requirements, or would it be a better idea to agree on a basic trip reduction goal?)

Step 2: Development of a Project Team

As with the EIS process, a TDM planning team should be assembled to develop the TDM programs or the TDM portions of the plan. The extent of the team will depend on the complexity of the plan or program, but may include:

- Local jurisdiction planning/transportation departments/RTPO staff
- Transportation Management Association staff or members
- Transit/rideshare agency staff
- WSDOT, FHWA or FTA staff
- Knowledgeable community members (businesspeople, advocacy groups)

Step 3: Gather Data

Assemble data on the following:

- Existing and planned TDM programs in the study area
- Existing and planned TDM programs in the surrounding region
- Local opinion - from other public agencies, stakeholders, the public

Step 4: Review

A thorough review of TDM strategies and their appropriate markets will result in a more complete understanding of how the various strategies may or may not be applied within the study area. This is also a good point to do some brainstorming with the planning team/stakeholders to generate ideas for new and different TDM strategies. When initiating development of a TDM program/plan, ***it isn't sufficient to simply look at what TDM is already planned***. This is where stakeholders and project team will need to really expand their thinking!

Step 5: Identify Travel Markets

Defining the travel/transportation market(s) that potentially will be impacted by the project is a necessary first step to identifying appropriate TDM strategies to address those markets. This step is most useful in conjunction with Table 1.1.

Step 6: Select Primary Strategies

Select TDM strategies with the most potential effectiveness and relevance to the study area. This is where existing conditions, existing plans, the transportation markets and potential TDM strategies are brought together. The preliminary screening process in Chapter Three of this guide is designed to assist in this process.

Step 7: Select Complementary Strategies

Some TDM strategies are more complementary than others — and some are virtually essential companion strategies. Therefore, it is necessary to give this issue careful consideration. Coordination with other agencies (transit agencies, for instance) may be essential at this point to gain commitment to those portions of the program. Table 4.1, which summarizes complementary strategies, will be useful at this point.

Step 8: Details

At this point it will be necessary to take the list of strategies and work through exactly what they will contain and how they will be implemented.

It is important to consider that because TDM strategies are always evolving and are market-based, some degree of flexibility will have to be built in. It may be appropriate to establish some goals, review and evaluation policies and flexible funding sources.

Step 9: Estimate Costs and Effectiveness

Using the data from this guide, other relevant research, and the collective wisdom of the TDM planning team, estimate trip reductions, costs, and cost effectiveness of the strategies being considered. Readjust the program or plan (repeating steps 6, 7, and 8) if necessary.

TDM in the EIS Process

The National Environmental Policy Act of 1969 established the requirement for NEPA review: Agencies involved in any project receiving federal money must conduct NEPA review for “major actions significantly affecting the quality of the human environment.”

Washington’s State Environmental Policy Act (SEPA) parallels NEPA and requires similar procedures for actions of statewide significance not affected by NEPA.

NEPA/SEPA has two broad goals: to provide better information to the public and decision makers and to assist in decision-making. It is important to recognize that the results of NEPA review do not determine the course of action taken. Their role is to provide advisory/information sharing documents only and is not legally binding. There are three types of environmental review under NEPA:

Categorical Exclusions are actions with no significant impacts, or ones previously determined by federal agencies to have no such impacts - such as lane striping or repaving. This is the simplest form of review, typically a short internal memo.

Environmental Assessments (EA) are required for actions that are unlikely or not known to have significant impacts. An EA determines whether or not proposed actions are significant. EAs cover the same issues as an EIS, but are not as procedurally complex. Two outcomes are possible from an EA: FONSI (Finding of No Significant Impact) or potential for significant impacts. In the case that there is the potential for significant impacts, an EIS must then be prepared.

Environmental Impact Statements (EIS) are lengthy and complex. The granddaddy of the three NEPA processes, an EIS is prepared when proposed actions are likely to have significant environmental impacts, or when an EA determines that there is potential for significant impacts. A lead agency (typically the federal agency with primary authority over the potential action) is responsible for preparing the EIS. The lead agency will not always be the project applicant.

The following is a description of the basic EIS process. Within this process, the role of a TDM planning team is highlighted. For further resources about the EIS process, see the bibliography section of this guide. For a summary, see the EIS Process Checklist at the end of this chapter.

Step 1. Pre-Scoping and Preparation

An EIS will be developed under the guidance of a main study team, usually assembled by the lead agency. We strongly recommend that for major EISs a separate TDM planning team be convened to assist the main study team, since those on the main study team may not be those who are most knowledgeable in TDM.

Knowledgeable members of a TDM planning team may be found in many places. Transit/rideshare agency staff, planners from local jurisdictions, administrators of local CTR ordinances, staff of Transportation Management Associations (TMAs), major employers, WSDOT staff (OUM's TDM Resource Center or the CTR group, for example), staff from advocacy groups, and consulting firms can all provide valuable input.

Most of the TDM planning team's work will take place within the first four steps of the EIS process. In this early phase, data should be gathered to complete the picture of the project environment and fully outline any existing or planned TDM within the geographic boundaries of the study. Besides being essential to fully understand what is going on in the study area, the identification of existing/planned TDM will guide the TDM planning team on what is acceptable to introduce to the study area, and become the basis for identifying which TDM strategies should be included in which alternatives.

Other data that may be relevant and/or useful to gather might include:

- Other studies, especially local studies, that document demand for/effectiveness of TDM measures
- Employment data, especially if there are CTR programs or other trip reductions programs in the study area
- Information on major trip generators/attractors in the study area
- Information on land uses and transit in the study area

Step 2. Scoping

The goal of scoping is to determine the issues appropriate for analysis in the EIS - the range of "reasonable" alternatives, type and depth of analysis, and methodology. "Early and meaningful" public input is required to be solicited from other agencies and the public, so at this point, the lead agency team will have typically developed a thorough public involvement plan.

Input from the scoping phase is extremely influential to the EIS process, as it determines much of the nature of the EIS and lays out what alternatives are on the table. During the scoping, it is therefore important for those on the TDM planning team to make sure that TDM is given an appropriate role in the alternatives and their evaluation - one that does not make unrealistic promises, but is not merely obligatory either.

Step 3. Development of Purpose and Need Statement

The Purpose and Need Statement should clearly state why some action is necessary, and what the study is intended to achieve. An initial version of a Purpose and Need Statement will have been prepared by the lead agency/project applicant before scoping began. At this point, the Purpose and Need will be revised on the basis of input received during the scoping process.

The Purpose and Need Statement is the first threshold that all alternatives must cross: if an alternative, or a certain aspect of that alternative, does not successfully meet the parameters of the purpose and need statement, it should be excluded from the EIS. For this reason, the Purpose and Need must be worded carefully - it should not be so vague as to allow the inclusion of every possible idea or concept, but should not limit reasonable alternatives from being carried through the analysis.

The wording of a Purpose and Need Statement will affect the role that TDM has in the EIS, and is worthy of careful attention from the TDM planning team.

Step 4. Development of Alternatives for Analysis

During the early years of NEPA, projects analyzed were often foregone conclusions with little real choice between alternatives - for instance, an EIS would contain a whole range of different highway alternatives but say nothing about transit. These days, the process has been better clarified and is better understood by all participants - the result being, more often than not, a range of alternatives that presents real choices, including TDM and transit.

The EIS must include a no-action alternative, along with a full range of other reasonable alternatives. Highway or corridor studies are strongly encouraged to include a TDM/TSM alternative. The alternatives considered but rejected must also be discussed - for instance, those that did not meet requirements of the Purpose and Need statement, those for which public input was overwhelmingly negative, and those which were not feasible or environmentally unsuitable.

During the development of the alternatives that go through the full analysis, there may be a couple of stages where alternatives go through quick and dirty “screening” processes to make sure they are appropriate, reasonable and acceptable for the final analysis. During those stages, descriptions of programs and levels of effectiveness are rougher and less specific.

Alternatives developed may be either “pure” or “hybrid” alternatives. For instance, in order to establish the parameters of what is possible under transit service expansion, it may be more useful to analyze an alternative that includes maximum transit expansion and nothing else. Or it may be deemed more appropriate (due to issues of implementation and/or political feasibility) to develop an alternative that includes not only some transit expansion, but expanded TDM programs and extension of the HOV lane network. In most cases, the range of alternatives will include some pure and some hybrid alternatives.

In the case of a typical highway/corridor study, the list of alternatives for analysis might include:

- No-Action
- TDM/TSM only
- Transit Service Expansion only
- Transit Service Expansion Focused (with Aggressive TDM Programs, HOV Lane Expansion, and Nonmotorized Improvements)
- Highway Widening Focused (with Moderate TDM Programs, Moderate Transit Service Expansion, and some Nonmotorized Improvements)
- Highway Widening only

Although NEPA regulations strongly recommend the screening of a stand-alone TSM/TDM alternative, in many cases a stand-alone alternative will need to be combined with other alternatives to meet the Purpose and Need of the project. However, according to requirements within ISTEA and TEA-21, if a highway project significantly increases highway capacity for SOVs and is located within a nonattainment area as determined by the Clean Air Act, the Purpose and Need Statement must demonstrate why TSM/TDM and nonbuild options are not sufficient. Therefore, there may be a need at the beginning of the project to develop some sort of rudimentary stand-alone alternative regardless.

A stand-alone alternative may need to include highly aggressive strategies, such as congestion pricing (tolls) and restricted access. Demonstrating the ability to achieve trip reductions through application of TDM measures, over time, will help broaden the knowledge base of what is possible with TDM, increase understanding of the different types of TDM strategies, and illustrate what is needed to implement them.

It will also be necessary for the TDM planning team to develop TDM programs for inclusion in any hybrid alternatives. These will most likely take three forms:

Aggressive TDM should represent strategies to attain the highest reasonably achievable level of trip reduction. Since so many TDM strategies are complementary to increases in transit service, an aggressive TDM package will probably be combined with the Transit Alternatives.

Standard/Moderate TDM packages may represent only a small or moderate increase over what is currently being implemented/planned. A moderate TDM package can be paired with Transit Expansion or Highway Expansion Alternatives.

Assumed/Minimal TDM only assumes that the TDM programs currently in operation or planned will continue.

An Important FYI:

It's possible that the model being used to analyze the alternatives for the EIS already assumes a significant percent of trip reduction due to "planned" TDM, which may not actually be planned — just assumed. This could mean that strategies sufficient to reach the trip reduction from TDM that is assumed by the model must also be included within the TDM alternative. Care should be taken to avoid double counting — this issue is worthy of serious discussion!

For most studies it is possible that the TDM Planning Team will have many recommendations to the main study team for their consideration. For example — perhaps a Stand-Alone TDM Alternative, though operationally feasible, may not appear to be politically acceptable due to local pressures to construct new capacity. Just the same, it should be developed and passed on for further consideration by the full project planning team. Or, perhaps, an aggressive TDM program, while not meeting all demand, could be capable of "buying some time" (postponing build options). If so, again, the main study team should be able to consider it.

Step 5. Analysis of Alternatives

At this point, the TDM alternatives (and TDM portions of other alternatives) should be clearly defined. Impacts and benefits should then be calculated. Impacts and benefits could

include monetary and environmental costs, trip reductions, travel time savings, or other changes in travel behavior. Since for many strategies, hard data doesn't exist, use the data within this guide, other relevant research, and the collective wisdom of the TDM planning team to develop the best estimates possible. These estimates are then passed on to the main study team for full analysis.

The full range of alternatives are then analyzed for impacts and benefits by the main study team. Technical studies, addressing a whole list of different topics, are developed to determine the environmental consequences of each alternative. Topics covered in the technical studies for highway/corridor analysis include both biological/physical impacts and social/economic impacts. It is also necessary to analyze construction impacts, indirect impacts, and cumulative impacts of the alternatives. The goals of the project must be weighed with the environmental impacts, both in the short and long term.

The bulk of an EIS is spent on the above reports, which determine if and how impacts are "significant." Mitigation measures must be determined for all actions deemed to have significant environmental impacts. At this point, if there are significant impacts in any one of the alternatives, the TDM planning team may be called upon to develop mitigation measures.

There are no federal guidelines on what is significant, no requirement to make a finding of significance, and no requirement as to the extent of mitigation necessary. In general, the goal of mitigation is to use it to reduce impact to the level at which the impact is no longer significant. However, since outlining mitigation measures in the EIS amounts to a commitment to those measures by the project applicant, they are limited by feasibility and cost.

Step 6. Comparison of Alternatives

Comparison of alternatives is done wholly by the main study team, and is typically summarized in the EIS with some sort of matrix.

Step 7. Distribution of Draft EIS (DEIS)

The DEIS is circulated for comment from the public and other relevant agencies. Public hearings are also held to gather comments.

Step 8. Preparation of Final EIS (FEIS)

The FEIS is required respond to comments on the DEIS, either by modifying the document or justifying why comments do not require further response. The FEIS must also identify the lead agency's preferred alternative.

Step 9. Prepare Record of Decision (ROD)

The Record of Decision is used to justify the agency's final decision on the action taken. It must discuss the agency's preferred alternative, the decision-making factors and identify the "environmentally preferred" alternative, if the preferred alternative is different from the environmentally preferred alternative.

EIS Process Checklist

Main Study Team

TDM Planning Team

Step 1. Pre-Scoping and Preparation

Select lead agency
Select study area boundaries
Develop general work plan
Develop public involvement plan

Assemble TDM Planning Team
Gather information

Step 2. Scoping

Determine range of alternatives for EIS
Determine methodology
Determine depth and breadth of analysis
Solicit “early and meaningful” public involvement

Provide input to assure that TDM is given an appropriate role

Step 3. Development of Purpose and Need Statement

Revise Purpose and Need Statement to reflect input from public and stakeholders

Provide input to assure that TDM is given an appropriate role

Step 4. Development of Alternatives for Analysis

Alternatives to be evaluated must include a full range of alternatives, plus a no-action alternative.

Follow steps 4-7 of the General TDM Planning Process to make recommendations for a stand-alone TDM alternative (if appropriate), and to develop TDM portions of hybrid alternatives.

Step 5. Analysis of Alternatives

Estimate impacts and benefits for full range of alternatives

Estimate impacts and benefits for TDM alternative or TDM portions of other alternatives

Develop mitigation measures for those alternatives whose impacts are significant

Potential for inclusion of TDM measures as mitigation

Step 6. Comparison of Alternatives

Comparison of alternatives is done wholly by main study team, although the TDM planning team may be asked to provide input.

Step 7. Distribution of Draft EIS (DEIS)

Main study team will distribute DEIS for comment by public and other agencies, and organize public hearings.

Step 8. Preparation of Final EIS (FEIS)

Main study team will revise the DEIS based on input from the public and other agencies. If there are major revisions, the TDM planning team may be asked to provide input on those revisions. The lead agency will choose a preferred alternative.

Step 9. Preparation of Record of Decision (ROD)

The record of decision will be prepared by wholly by the main study team.

